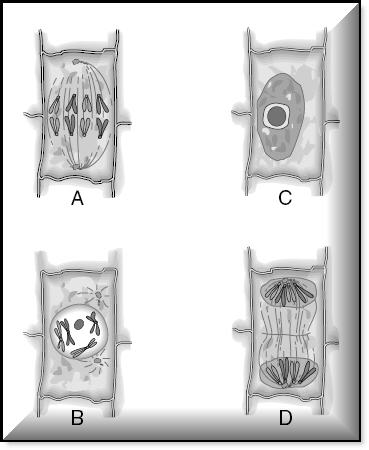
Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

**Unit 5 Review Packet: Cell Division**

Ms. Ottolini, PreAP Biology

1. Draw a chromosome. Label the sister chromatids and centromere.
2. Why does chromatin coil up into chromosomes in preparation for mitosis?
3. When does DNA replication occur during the cell cycle?
4. Why does DNA replication have to occur before cell division?
5. When do normal cell activities (ex: growth) occur during the cell cycle?



1. Explain what is occurring in each image shown to the right. Make sure to include the NAME of each stage of the cell cycle/mitosis.

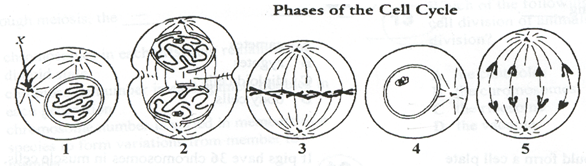
A:

B:

C:

D:

1. What is the correct order of the images shown to the right?



1. Explain what is occurring in each image shown above. Make sure to include the NAME of each stage of the cell cycle/mitosis.

1:

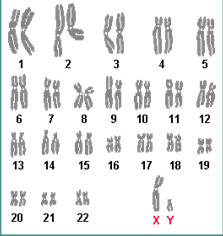
2:

3:

4:

5:

1. What is the correct order of the images shown on the previous page?
2. Why does Ms. Ottolini say that telophase is like “reverse prophase?”
3. Why do scientists believe that centrioles (i.e. the “churro-shaped” structures found inside the centrosome) are not directly involved in the formation of the mitotic spindle? (Instead, the “sun-like” structure surrounding the centrioles called the centrosome is primarily responsible for the formation of the mitotic spindle.)
4. What is the main purpose of mitosis in eukaryotic single-celled organisms (ex: protists like amoebas)? How is this process different from binary fission in prokaryotic cells (ex: bacteria)?
5. What are the purposes of mitosis in eukaryotic multicellular organisms (ex: plants and animals)?
6. What is the purpose of meiosis?
7. A blood cell in a chicken contains 78 chromosomes. How many chromosomes will a chicken sperm cell contain?
8. An egg cell in a cow contains 30 chromosomes. How many chromosomes will a cow nerve cell contain?
9. In what organ does meiosis (aka oogenesis) in human females occur?
10. In what organ does meiosis (aka spermatogenesis) in human males occur?
11. How are oogenesis and spermatogenesis different?

1. Why are three polar bodies and only one functional egg cell created during oogenesis?
2. When during meiosis does crossing over occur? What happens during crossing over?
3. What is the purpose of crossing over?
4. What is a karyotype? How is the last chromosome pair shown in the karyotype to the right different from the other chromosome pairs?
5. What is nondisjunction? How is nondisjunction related to Down syndrome (aka trisomy 21)?
6. How is meiosis I different from meiosis II? Which process is most similar to mitosis? (Explain your answer!)
7. Why do eggs and sperm need to be haploid cells? Use the terms meiosis and fertilization in your answer.
8. Fill in the information in the columns below to compare characteristics of mitosis and meiosis.

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Mitosis** | **Meiosis** |
| # of Divisions? |  |  |
| # of Daughter Cells? |  |  |
| Creation of Haploid or Diploid Cells? |  |  |
| # of Chromosomes in Human Daughter Cells? |  |  |
| Creation of Somatic Cells or Gametes? |  |  |
| Type of Reproduction: Asexual, Sexual, or Both? |  |  |
| Used for Growth / Tissue Repair? (yes or no) |  |  |

1. How is cytokinesis different in plant vs. animal cells?

*Note: For the following three questions, refer to your “Why do cells need to divide? Worksheet”*

1. What happens to the surface area to volume ratio (represents the amount of cell membrane compared to the volume of a cell) as the size of a cell increases?
2. Which cell is able to transport materials most efficiently across its membrane—a small cell or a large cell?
3. Use your answer to the previous two questions to provide support for the following statement: “Cells cannot grow forever. Eventually they have to divide.”